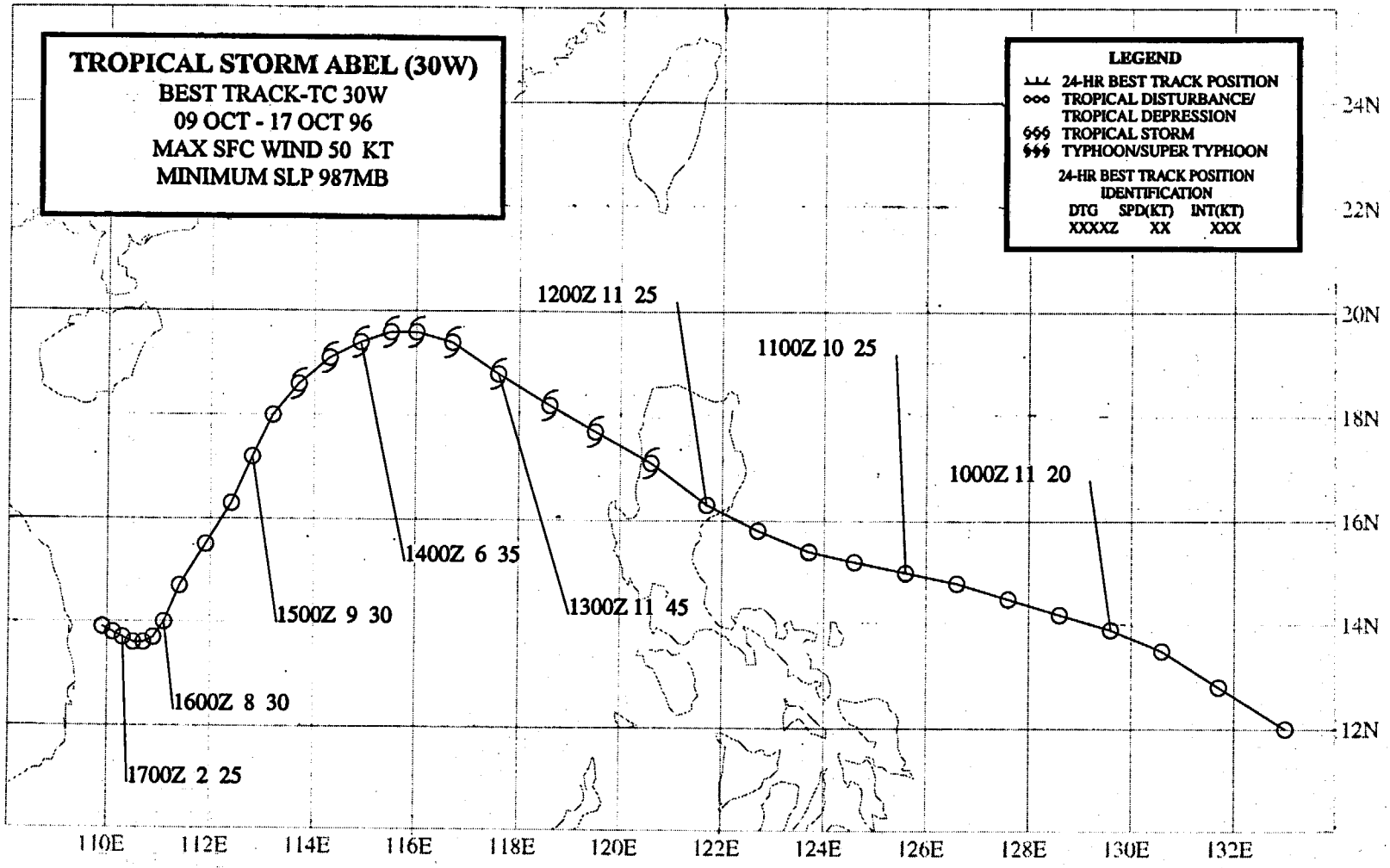
TROPICAL STORM ABEL (30W)
BEST TRACK-TC 30W
09 OCT - 17 OCT 96
MAX SFC WIND 50 KT
MINIMUM SLP 987MB
LEGEND
24-HR BEST TRACK POSITION
TROPICAL DISTURBANCE/ TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON/SUPER TYPHOON
24-HR BEST TRACK POSITION IDENTIFICATION
DTG SPD(KT) INT(KT)
XXXXZ XX XXX
1200Z 11 25
1100Z 10 25
1000Z 11 20
1400Z 6 35
1500Z 9 30
1300Z 11 45
1600Z 8 30
1700Z 2 25
24N
22N
20N
18N
16N
14N
12N
110E
112E
114E
116E
118E
120E
122E
124E
126E
128E
130E
132E

TROPICAL STORM ABEL (30W)

I. HIGHLIGHTS

Abel originated from a monsoon depression in the Philippine Sea, crossed Luzon, and became a tropical storm in the South China Sea. Forced to move southwestward by the northeast monsoon, it dissipated over water while approaching the coast of southern Vietnam.

II. TRACK AND INTENSITY

At the beginning of October, Yates (28W) and Zane (29W) recurved and moved into the midlatitudes. After this, for about one week, the low latitudes of the WNP became relatively free of deep convection, and there was a break in TC activity. By the end of the first week of October, amounts of deep convection began to increase in the low latitudes of the WNP, and became concentrated within two large areas: one near Guam and the other north of the Marshall Islands. The area of deep convection located near Guam moved westward and became a monsoon depression in the Philippine Sea. With the help of animated high-resolution visible satellite imagery, a LLCC was detected south of a band of persistent deep convection, embedded in the large cyclonic circulation of the monsoon depression. This LLCC was mentioned on the 100600Z October Significant Tropical Weather Advisory. Shortly thereafter, at 100730Z, the JTWC issued a TCFA when conditions appeared to favor the formation of a TC. Remarks on the TCFA included:

". . . Latest animated visual satellite imagery indicates a well defined low-level circulation has developed [east of the Philippines]. Newly developed convection is primarily to the north of the circulation center but is showing signs of improved organization. . . ."

The first warning on Tropical Depression (TD) 30W was issued valid at 110000Z. Remarks on the first warning included:

"A tropical depression has formed in the Philippine Sea approximately 80 nm east-northeast of Catanduenas Island in the Philippines. Animated visual satellite imagery . . . and data from several ships . . . indicates that a partially exposed 1003 mb low-level circulation exists within a larger monsoonal circulation that stretches almost 400 nm to the northeast of the [LLCC]. . . ."

On 12 October, the system crossed the island of Luzon and entered the South China Sea. Perhaps as a result of lee-side effects, northerly gale-force winds were reported over water as soon as the low-pressure center reached the northwestern tip of Luzon. In real time, satellite intensity estimates below 35 kt (18 m/sec) were favored over the gale-force ship reports, and TD 30W was upgraded to Tropical Storm Abel on the warning valid at 131200Z. In post analysis, however, the satellite imagery was reevaluated, the ship reports of gale force winds were given a higher weight, and TD 30W became a tropical storm at 120600Z. Abel reached its peak intensity of 50 kt (26 m/sec) at 121200Z.

On 14 October, Abel began to move toward the southwest under the influence of high pressure over southern China, which contributed to strong low-level northeasterly flow to Abel's west and north. While moving toward the southwest, Abel began to weaken. The deep convection accompanying the well defined LLCC on 16 October (Figure 3-30-1) decayed, and the final warning was issued, valid at 170600Z, as the system dissipated over water while approaching the coast of southern Vietnam.

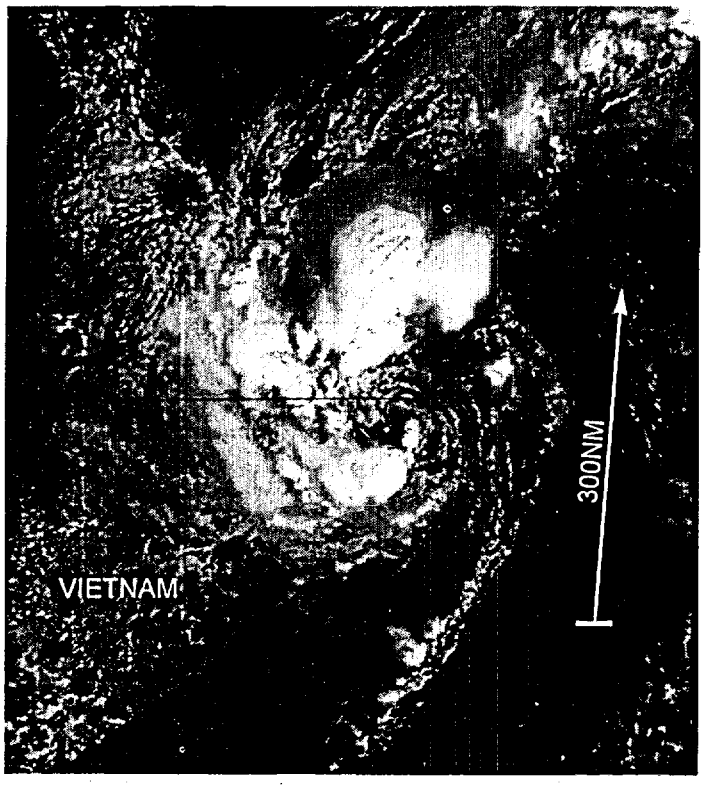

Figure 3-30-1 Abel moves slowly toward the coast of southern Vietnam, its well-defined LLCC is surrounded by cells of deep convection (160331Z October visible GMS

III. DISCUSSION

Unusual structure revealed by animated visible satellite imagery

When Abel was forming east of the Philippines, animation of visible satellite imagery indicated that the LLCC was displaced well to the south of the deep convection and also well to the south of the center of symmetry of the cirrus outflow (Figure 3-30-2). It is common for satellite fixes to be too far north in the monsoon depression stage of TC development, but in the case of Abel, the LLCC was unusually distant from the deep convection and the center of symmetry of the upper-level anticyclonic pattern of the cirrus. Synoptic data, and scatterometer data also supported this large displacement.

IV. IMPACT

As the weakening Abel approached Vietnam, rough seas overturned 146 boats and two fishermen were lost. At least 11 other people were reported missing.

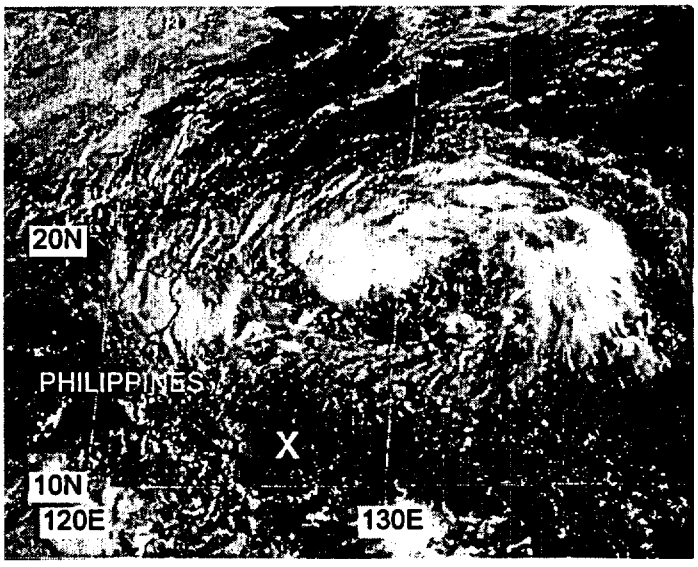

Figure 3-30-2 Animation showed that the LLCC (labeled, X) of the pre-Abel monsoon depression was displaced unusually far from its deep convection and from the center of symmetry of its upper-level cirrus outflow (102331Z October visible GMS imagery).